REMARKS

In response to the final Office Action of December 16, 2009, applicant asks that all claims be allowed in view of the following remarks.

Claims 1, 7, 18, 28, 59, 64, 66, 71-74, 76-82, and 84-93 are pending, with claims 1, 18, 76, and 82 being independent. Claim 76 has been amended to correct a minor typographical error. Claims 2-6, 8-17, 19-27, 29-58, 60-63, 65, 67-70, and 75 were cancelled previously, and claim 83 is being cancelled, without prejudice or disclaimer of subject matter, by this reply. No new matter has been introduced.

Claim Rejections—35 U.S.C. § 103

Claims 1, 7, 18, 20, 21, 28, 59, 60, 64, 66, and 71-82 and 83-87

Claims 1, 7, 18, 20, 21, 28, 59, 60, 64, 66, 71-82, and 83-87 have been rejected as being unpatentable over U.S. Patent No. 6,373,454 (Knapp) in view of U.S. Patent No. 6,369,786 (Suzuki) and U.S. Patent Application Publication No. 2003/0231152 (Shin).

With respect to claim 1 and its dependent claims, applicant requests withdrawal of this rejection because neither Knapp, Suzuki, Shin, nor any proper combination of the three, describes or suggests that a gate width of a second transistor connected in the manner recited in claim 1 is larger than a gate width of a first transistor connected in the manner recited in claim 1, and because, even assuming for sake of argument that Knapp and Suzuki may be combined, it would not have been obvious to further modify Knapp and Suzuki in view of Shin in the manner proposed by the Office.

Knapp relates to an active matrix display device. See Knapp at abstract. In Knapp, a switch 33 connects a display element 20 to a drive transistor 30. See Knapp at col. 6, lines 21-25 and FIG. 2. When the switch 33 is closed, the transistor 30 draws current through the display element 20 so as to produce the required amount of light from the display element 20. See Knapp at col. 6, lines 50-53. An input line 35 connects a switch 37 to a node 36 (see Knapp at col. 6, lines 39-43), and an input signal I_{in} corresponding to the current required for the display

element 20 is driven through the transistor 30 via the input line 35 (see Knapp at col. 6, lines 63-75 and FIG. 2).

Suzuki discloses a matrix driving apparatus that includes scanning electrodes and signal electrodes, and a precharge circuit connected to the signal electrodes. See Suzuki at col. 3, lines 52-64. In one aspect of Suzuki, a precharge circuit 3A includes diodes D_1 to D_x, each of which is connected to a corresponding one of signal electrodes SiE_1 to SiE_x. See Suzuki at col. 5, lines 50-52 and FIG. 7.

Shin discloses an image display having pixels that are formed at an intersection of scan and data lines. See Shin at ¶ 0008. Each of the pixels includes a light-emitting element and two transistors, M1 and M2, that form a current mirror. See Shin at ¶ 0014, ¶ 0016, and FIG. 2.

However, none of these references describes or suggests that a gate width of a second transistor connected in the manner recited in claim 1 is larger than a gate width of a first transistor connected in the manner recited in claim 1, nor would it have been obvious to modify these references to include such a feature.

The Office appears to equate Knapp's transistor 30 with the recited first transistor and Suzuki's diode D_x included in the precharge circuit 3A with the recited second transistor (see the final Office Action at pages 3-4), but the Office acknowledges that neither Knapp nor Suzuki disclose that a gate width of the second transistor is larger than a gate width of the first transistor (see the final Office Action at page 5). For this feature, the Office relies on Shin, stating, on page 5 of the final Office Action, that "it would have been obvious ... to modify Knapp and Suzuki with the teachings of Shin, gate width of the second transistor being larger than the gate width of the first transistor, because it allows for greater current to flow from the precharge circuit, which allows for a faster precharge." Applicant respectfully disagrees.

First, Shin does not disclose that a gate width of a second transistor is larger than a gate width of a first transistor. Rather, in Shin, the channel width of the transistor M1 is greater than the channel width of the transistor M2, or the channel length of the transistor M1 is greater than the channel length of the transistor M2. See Shin at ¶ 0016. However, Shin makes no mention

of the gate width of either of the transistors M1 and M2, and, therefore, Shin does not disclose that a gate width of a second transistor is larger than the gate width of a first transistor.

Second, the Office's rationale for combining Knapp and Suzuki with Shin does not provide a sufficient reason for combining these references. The Office equates Suzuki's diode D_x with the recited second transistor and reasons that it would have been obvious to combine Knapp and Suzuki with Shin because modifying Suzuki's diode D_x to have a larger gate width would allow "for a greater current to flow from the precharge circuit, which allows for a faster precharge." See final Office Action at page 5. However, Suzuki's diode D_x is connected to a constant current source. See Suzuki at FIG. 7. Thus, even if a gate width of a transistor that acts as the diode D_x could be increased, the amount of current that flows through the transistor would not change because the current is supplied by a constant current source. As a result, greater current would not flow through the diode D_x as a result of increasing the gate width, and, therefore, a desire for greater current flow would not lead to an increase in the gate width.

In response to this argument, the Office asserts that

> [e]ven though a constant current is being applied, the size of the gate width of the transistor determined if all or only a part of the current is able to flow through the transistor similar to how the diameter of a pipe changes how much water flows in the pipe. As a result, the increasing gate width side would allow more of the constant current to flow which allows the desired precharge voltage to be reached more efficiently.

See final Office Action at page 2. Applicant respectfully disagrees and believes that the Office's example relates to what would occur in a circuit including a constant voltage source (such as a battery), not in a circuit such as Suzuki's that includes a constant current source. The current from a constant current source is not influenced by a change in a load coupled to the constant current source. In contrast, a voltage supply typically behaves in a manner similar to the example provided by the Office, and the current through a resistance coupled to the voltage supply changes if the resistance changes. Accordingly, because the constant current source coupled to D_x provides a constant current to D_x regardless of the gate width, there would have been no reason to increase the gate width of Suzuki's diode D_x.

Finally, in the Response to Argument section on page 2 of the Office Action, the Office asserts that "Shin shows that two transistors can have different gate widths and that the difference in the sizes between the two transistors correlates to the amount of current flow." As discussed above, Shin does not disclose that the transistors M1 and M2 have different gate widths. Moreover, because Suzuki's diode D_x is coupled to a constant current source, even if Shin somehow could be interpreted to show that two transistors can have different gate widths, the increased gate width would not result in more current flowing through the diode D_x because the diode D_x is coupled to a constant current source.

For at least these reasons, Knapp, Suzuki, and Shin, alone or in combination, fail to describe or suggest a driven circuit including a first transistor, a signal line electrically connected to the first transistor through a node, a precharge circuit electrically connected to the signal line and including a second transistor, and a current source electrically connected to the first transistor and the second transistor, where a gate width of the second transistor is larger than a gate width of the first transistor, as recited in independent claim 1. Moreover, it would not have been obvious to modify Knapp and Suzuki with Shin.

Accordingly, applicant requests reconsideration and withdrawal of the rejection of claim 1 and its dependent claims.

Among other features, amended independent claim 76 recites a driven circuit including a first transistor, a signal line electrically connected to the first transistor through a node, a precharge circuit electrically connected to the signal line and including a second transistor, and a current source electrically connected to the first transistor and the second transistor, where a gate length of the second transistor is smaller than a gate length of the first transistor. Thus, claim 76 is allowable for reasons similar to those discussed with respect to claim 1. Accordingly, applicant requests reconsideration and withdrawal of the rejection of independent claim 76 and its dependent claims.

Among other features, independent claim 18 recites a driven circuit including a first transistor, and a precharge circuit comprising a second transistor, where a gate width of the second transistor is larger than a gate width of the first transistor. Similarly, independent claim

82 recites that a gate length of the second transistor is smaller than a gate length of the first transistor. Thus, independent claim 18 is allowable for reasons similar to those discussed above with respect to claim 1, and independent claim 82 is allowable for reasons similar to those discussed above with respect to independent claim 76. Accordingly, applicant requests reconsideration and withdrawal of the rejection of independent claims 18 and 82 and their dependent claims.

The dependent claims are allowable in their own right. For example, among other features, claims 88 and 89, which respectively depend from claims 18 and 82, recite "a second terminal of the first switch is electrically connected to the second switch." In rejecting these dependent claims, the Office asserts that "(Knapp: Fig. 2 and Suzuki: Fig. 7, both the precharge circuit (3A) and the current source circuit (C_{S1-x}) are electrically connected to both terminals of the first switch via switch 37 and transistor 30)." See final Office Action at page 10. First, applicant is unsure how the Office intends to combine the structure shown in Figure 2 of Knapp with that shown in Figure 7 of Suzuki to arrive at the features of claims 18 and 82. Second, in its rejection of claims 88 and 89, the Office appears to allege that Knapp's switch 37 is used to connect a terminal of a first switch. However, in its rejection of the independent claims, the Office equated the switch 37 with the recited first switch. It is unclear how Knapp's switch 37 may be equated with both the recited first switch and an element used to connect to one of two terminals of the first switch. For at least these additional reasons, applicant requests reconsideration and withdrawal of the rejection of dependent claims 88 and 89.

Claims 90-93

Claims 90-93, each of which depends from one of independent claims 1, 18, 76, and 82, have been rejected as being unpatentable over Knapp, Suzuki, Shin and U.S. Patent Application Publication No. 2002/0008687 (Tazuke). Applicant requests reconsideration and withdrawal of this rejection because Tazuke does not remedy the failure of Knapp, Suzuki and Shin to describe or suggest the subject matter of independent claims 1, 18, 76, and 82, nor does Tazuke describe or suggest the subject matter of claims 90-93.

Among other features, each of dependent claims 90-93 recites a fourth switch configured to control an electrical connection between a current source circuit and a precharge circuit. Acknowledging that none of Knapp, Suzuki and Shin describe or suggest this feature, the Office relies on Tazuke's switch 504.

Tazuke discloses an apparatus for driving data lines of a liquid crystal display (LCD) panel(see Tazuke at abstract) output pads 501 are connected to data lines DL of the LCD panel (see Tazuke at ¶ 0038). Switches 503 formed by transfer gates are between operational amplifiers 502 and the output pads 501, and switches 504 are formed by transfer gates and are provided between the output pads 501. See Tazuke at ¶ 0038 and FIG. 4. Thus, at most the switches 504 are configured to control an electrical connection between the output pads 501, not an electrical connection between a current source circuit and a precharge circuit.

As such, like Knapp, Suzuki and Shin, Tazuke also does not describe or suggest a fourth switch configured to control an electrical connection between a current source circuit and a precharge circuit, as recited in each of dependent claims 90-93.

The Office asserts that "incorporating the electrical connection of two of Tazuke into the invention of Knapp and Suzuki, one skilled in the art at the time of the invention to have achieved the claimed invention in that the precharge and current source lines would have been connected together in order to achieve line neutralization, which allows for more effective precharge." See final Office action at page 11. In making an obviousness rejection, the Office must explain why the differences between the prior art and the claims would have been obvious to one of ordinary skill in the art. See MPEP § 2141(III). However, the Office has not established a basis for "concluding that it would have been obvious to one of ordinary skill in the art to bridge the gap" between that which is disclosed in Tazuke and the noted features of claims 90-93. See id. For example it is unclear how a skilled artisan would have arrived at using Tazuke's switch 504, which is between the output pads 501, as a fourth switch configured to control a electrical connection between a current source and a precharge circuit, as recited in each of claims 90-93.

For at least these reasons, none of Knapp, Suzuki, Shin, Tazuke, or any proper combination of the four, describes or suggests the noted features of claims 90-93, nor would it have been obvious to modify these references to include the noted features.

Accordingly, applicant requests reconsideration and withdrawal of the rejection of claims 90-93.

Conclusion

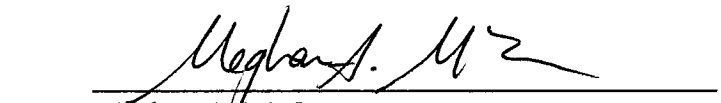
Applicant submits that all claims are in condition for allowance.

It is believed that all of the pending issues have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this reply should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this reply, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fees are believed due at this time. Nonetheless, please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: March 16, 2010



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